***Design and demonstrate a computer network for the School of Computer Science and Engineering (SCOPE) at Vellore Institute of Technology to link laboratories across different floors and different buildings, with the following specifications and objectives:-***

***Specifications:***

***48 computers per lab***

***2 laboratories per floor & 3 floors per building***

***Number of buildings: 3***

***Interconnect all the laboratories using at least 4 relevant networking devices***

***Analyse and validate your design based on the given objectives.***

***Objectives:***

***Reliability***

***2)***

***With appropriate examples, discuss why single-dimensional parity-based error detection is not a trusted and preferred detection technique in data communication networks. Demonstrate the checksum error detection technique for the given data and test cases:-***

***Data to be sent: 1010101010101010101011011***

***No. of checksum bits: 5***

***Test case-1: Error-free transmission of the given data***

***Test case-2: Induce burst error(flip first 3 bit from LSB)***

***Note: Demonstration should be done for error-free data transfer & with burst error states.***

**Ans 🡪 Selective single bit error and Burst error**

***3)***

***Analyse how the following issues affect the encoding schemes in digital data transmission and suggest suitable techniques to overcome these issues:-***

***Baseline wandering***

***Noise***

***Illustrate (using timeline diagram) a suitable encoding technique that might overcome the above-mentioned issues to transmit data as given below:-***

***Data to be transmitted: 111111110101000000001010***

***Performance***